Ares I Crew Launch Vehicle and Ares V Cargo Launch Vehicle

NASA's Ares Projects — Ares I Crew Launch Vehicle and Ares V Cargo Launch Vehicle

Launchers for the Next Phase of American Space Exploration

The Ares I crew launch vehicle and Ares V cargo launch vehicle will transport explorers to the Moon, and then onward to Mars and other destinations in the solar system. These systems are being designed for safer, more reliable, and more cost-effective operations.

Building on Powerful, Proven Hardware

The Ares I and the Ares V launch vehicles feature common hardware derived from the Apollo Saturn, Space Shuttle, and other programs. The Ares I will loft the Orion crew exploration vehicle into orbit early next decade. It comprises a Shuttle-legacy 5.5-segment Reusable Solid Rocket Booster (RSRB) first stage and a new upper stage powered by the J-2X liquid oxygen/liquid hydrogen (LOX/LH_2) engine with heritage from the Saturn rocket's J-2 engine. The Ares I/Orion in-line configuration includes a launch abort system to move the crew swiftly away from the rocket in the event of an emergency, significantly improving astronaut safety.

The Ares V will lift the Altair lunar lander into orbit late next decade. The Ares V first stage comprises two 5.5-segment RSRBs, which are similar to the Ares I first stage, and a core stage propulsion system consisting of a Saturn-class 33-foot-diameter tank delivering LOX/LH_2 to a cluster of six commercially available RS-68 main engines. The Ares V second stage, known as the Earth departure stage (EDS), transports the Altair lunar lander to low-Earth orbit. The EDS is powered by the same J-2X engine powering the Ares I upper stage.

Expanding Horizons

For lunar missions, the Ares I and Ares V will work in concert to send people to the Moon. The Ares V heavy-lift system will loft Altair, equipment, and supplies needed to work on the Moon.

The Ares I will launch the crew into space. After the first stage is jettisoned, the Ares I upper stage will ignite its J-2X engine to place Orion into orbit. Once Orion reaches orbit, it will rendezvous and dock with Altair and the Earth departure stage. After checking out all systems, the Earth departure stage's J-2X engine will perform a translunar injection burn, and then Orion and the lander are off to the Moon.

With its roots in the Saturn V and the Space Shuttle, and its future in traveling to the Moon and Mars, the Ares I and Ares V will help America achieve the next step toward expanding knowledge through space exploration.

A Nationwide Team

The Ares development effort is a government and industry partnership, led by Ares Projects at NASA's Marshall Space Flight Center in Huntsville, AL, under the direction of the Constellation Program at NASA's Johnson Space Center in Houston, TX, and the Exploration Systems Mission Directorate at NASA's Headquarters in Washington, DC.

For more information see: **www.nasa.gov/ares**

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